WHAT IS CLAIMED IS:

1. A method for segmenting an object within a current digital image frame, comprising the steps of:

receiving a set of control points used in deriving an object boundary from a prior image frame, wherein the received set of control points serves as an initial set of control points for the current digital image frame;

defining a restricted area within the current digital image frame based on the received set of control points, wherein the restricted area corresponds to a band about the object boundary;

updating the initial set of control points to an updated set of control points in response to an operator command;

defining a current-frame object boundary for said object of the current digital image frame using the updated set of control points, wherein said step of defining the current-frame object boundary comprises deriving a closed contour connecting each control point of the updated set of control points, wherein only image data within the restricted area are eligible to form the closed contour.

2. The method of claim 1, wherein the step of updating comprises updating the initial set of control points to an updated set of control points in response to an operator command to perform either one of moving a control point or adding a control point.

3. The method of claim 2, further comprising the step of:

when the operator command either one of moves or adds a select control point outside the restricted area, redefining the restricted area to encompass the select control point.

4. The method of claim 1, further comprising, prior to the step of updating, the steps of:

deriving edge energy data for the current image frame; and

deriving and displaying an initial estimate of the current-frame object boundary based on the received set of control points and the derived edge energy data.

5. The method of claim 4, wherein the current digital image frame is displayed and the initial estimate of the current-frame object boundary is overlaid onto the current digital image frame with the initial set of control points frame, wherein the step of updating the initial set of control points comprises selecting a control point of the initial set of control points with a pointing device and dragging the selected control point to a new location.

6. The method of claim 5, further comprising the steps of:

testing the new location of the selected control point to determine whether the selected control point is outside the restricted area;

when the new location of the selected control point is outside the restricted area, redefining the restricted area to encompass the selected control point in the new location.

7. The method of claim 5, wherein the step of defining the current-frame object boundary comprises deriving a path from the selected control point to a first adjacent control point and deriving a path from the selected control point to a second adjacent control point.

8. The method of claim 1, wherein the step of deriving a closed contour comprises for each one control point of the updated set of control points deriving a path from said each one control point to an adjacent control point, wherein the step of deriving a path comprises:

determining a distance from said one control point to said adjacent control point;

when said distance is less than a threshold distance applying a first set of rules for deriving the path from said one control point to the adjacent control point;

when said distance is greater than the threshold distance applying a second set of rules, different from the first set of rules, for deriving the path from said one control point to the adjacent control point.

9. The method of claim 8, wherein the first set of rules provide a more accurate path than the second set of rules for connecting control points which are less than the threshold distance apart.

10. The method of claim 8, wherein the second set of rules provide a more accurate path than the first set of rules for connecting control points which are more than the threshold distance apart.

11. The method of claim 1, wherein the step of defining the restricted area, comprises morphologically dilating a contour connecting the received set of control points.

12. The method of claim 1, further comprising the step of receiving an object boundary estimate of a prior digital image frame and wherein the step of defining the restricted area, comprises defining the restricted area within the current digital image frame from the received object boundary estimate, including the received set of control points.

13. An apparatus for segmenting an object within a current digital image frame, comprising:

a display for displaying the current digital image frame;

means for overlaying a set of control points used in deriving an object boundary from a prior image frame, wherein the overlaid set of control points serves as an initial set of control points for the current digital image frame;

a first processor which derives a restricted area within the current digital image frame based on the initial set of control points, wherein the restricted area corresponds to a band encompassing the initial set of control points;

an input device by which an operator is able to change the initial set of control points, the changed set of control points being an updated set of control points;

a second processor which generates a current-frame object boundary for said object of the current digital image frame using the updated set of control points by deriving a closed contour connecting each control point of the updated set of control points, wherein only image data within the restricted area are eligible to form the closed contour.

14. The apparatus of claim 13, wherein in response to the operator either moving or adding a select control point outside the restricted area with the input device, said first processor redefines the restricted area to encompass the select control point.

15. The apparatus of claim 13, wherein the first processor comprises means for testing the new location of the selected control point to determine whether the selected control point is outside the restricted area, the first processor redefining the restricted area to encompass the selected control point in the new location when the new location of the selected control point is outside the restricted area.

16. The apparatus of claim 13, wherein the second processor comprises means for deriving a path from a selected control point to a first adjacent control point and deriving a path from the selected control point to a second adjacent control point, wherein the selected control point has a location changed by the operator.

17. The apparatus of claim 16, wherein the deriving means comprises:

means for determining a distance from said selected control point to said first adjacent control point;

when said distance is less than a threshold distance applying a first set of rules for deriving the path from said selected control point to the first adjacent control point;

when said distance is greater than the threshold distance applying a second set of rules, different from the first set of rules, for deriving the path from said selected control point to the first adjacent control point.

18. The apparatus of claim 17, wherein the first set of rules provide a more accurate path, than the second set of rules, for connecting control points which are less than the threshold distance apart.

19. The apparatus of claim 17, wherein the second set of rules provide a more accurate path, than the first set of rules, for connecting control points which are more than the threshold distance apart.

20. The apparatus of claim 13, wherein the first processor comprises means for morphologically dilating a contour formed by the initial set of control points to define the restricted area.

21. The apparatus of claim 20, wherein said contour is an object boundary estimate from a prior digital image frame that includes the initial set of control points.

22. The apparatus of claim 13, wherein the first processor and the second processor are a common processor.

23. The apparatus of claim 13, further comprising:

means for deriving edge energy data for the current digital image frame;

means for deriving an initial estimate of the current-frame object boundary based on the received set of control points and the derived edge energy data, wherein said initial estimate of the current-frame object boundary is overlaid onto the current digital image frame.